

I CLAIM:

1. An isolated polynucleotide containing at least one human nucleotide sequence selected from the group consisting of:
  - (a) a nucleotide sequence which hybridizes to SEQ ID NO:1 under stringent hybridization conditions,
  - (b) a nucleotide sequence which is greater than 98% identical to SEQ ID NO:1,
  - (c) a nucleotide sequence encoding at least 75 contiguous amino acids of SEQ ID NO:2, and
  - (d) a nucleotide sequence complementary to the nucleotide sequence of (a) or (b) or (c);wherein the nucleotide sequence is at least 50 nucleotides in length.
2. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence encodes a polypeptide with Hairless transcription factor activity.
3. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence is at least 250 contiguous nucleotides of SEQ ID NO:1.
4. The isolated polynucleotide of Claim 3, wherein the nucleotide sequence is at least 500 contiguous nucleotides of SEQ ID NO:1.
5. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence is SEQ ID NO:1.
6. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence encodes at least 100 contiguous amino acids of SEQ ID NO:2.
7. The isolated polynucleotide of Claim 6, wherein the nucleotide sequence encodes at least 250 contiguous amino acids of SEQ ID NO:2.

8. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence encodes SEQ ID NO:2.

9. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence hybridizes to SEQ ID NO:1 at 65°C in a buffer of 500 mM NaHPO<sub>4</sub> pH 7.2, 7% SDS, 1% BSA, and 1 mM EDTA.

10. An expression construct comprising the polynucleotide of Claim 1 operably linked to a transcription regulatory region such that the nucleotide sequence or its complement is transcribed.

11. A transfected cell comprising the expression construct of Claim 10.

12. The expression construct of Claim 10 further comprising an origin of replication and a selectable marker.

13. A transfected cell comprising the expression construct of Claim 12.

14. An isolated double-stranded polynucleotide comprising the polynucleotide of Claim 1 and its complement.

15. A transfected cell comprising the double-stranded polynucleotide of Claim 14.

16. An expression system comprising:

(a) the expression construct of Claim 10 which produces a polypeptide with Hairless transcription factor activity;

(b) a reporter construct comprising a transcription regulatory region responsive to Hairless transcription factor operably linked to a reporter gene; and

(c) RNA polymerase, transcription factors, and co-factors which allows the polypeptide with Hairless transcription activity to regulate transcription of the reporter gene which is mediated by the transcription regulatory region responsive to Hairless transcription factor.

17. The expression system of Claim 16 wherein transcription of the reporter gene is activated by the polypeptide with Hairless transcription activity in vivo.

18. The expression system of Claim 16 wherein transcription of the reporter gene is activated by the polypeptide with Hairless transcription activity in vitro.

19. An isolated polypeptide encoded by the polynucleotide of Claim 1.

20. The polypeptide of Claim 19 further comprising a heterologous polypeptide domain.

21. The polypeptide of Claim 19, wherein the polypeptide has transcription factor activity.

22. A method of screening for a chemical agent which modulates Hairless-mediated transcription comprising:

(a) incubating a candidate chemical agent, a polypeptide with Hairless transcription factor activity, and a reporter construct comprising a transcription regulatory region responsive to Hairless transcription factor operably linked to a reporter gene;

(b) measuring Hairless-dependent transcription of the reporter gene; and

(c) identifying the chemical agent which modulates Hairless-mediated transcription by a change in transcription of the reporter gene

mediated by Hairless transcription factor activity.

23. The method of screening for a chemical agent of Claim 22, wherein transcription of the reporter gene mediated by Hairless transcription factor activity is performed in vivo.

24. The method of screening for a chemical agent of Claim 22, wherein transcription of the reporter gene mediated by Hairless transcription factor activity is performed in vitro.

25. A method of screening for a chemical agent which modulates binding between Hairless and thyroid hormone receptor comprising:

(a) incubating a candidate chemical agent, a polypeptide with Hairless transcription factor activity, and a polypeptide with thyroid hormone receptor activity;

(b) measuring binding of the polypeptide with Hairless transcription factor activity and the polypeptide with thyroid hormone receptor activity; and

(c) identifying the chemical agent which modulates binding between Hairless and thyroid hormone receptor by a change in binding of the polypeptide with Hairless transcription factor activity and the polypeptide with thyroid hormone receptor activity.

26. The method of screening for a chemical agent of Claim 25, wherein the polypeptide with Hairless transcription factor activity is a fusion polypeptide immobilized on a solid support.

27. The method of screening for a chemical agent of Claim 25, wherein the polypeptide with thyroid hormone receptor activity is a fusion polypeptide immobilized on a solid support.

28. A method of screening for a chemical agent which modulates Hairless activity comprising:
- (a) incubating a candidate chemical agent with a cell comprising a Hairless gene or protein,
  - (b) measuring Hairless gene or protein activity, and
  - (c) identifying the chemical agent which modulates Hairless activity.
29. The method of screening for a chemical agent of Claim 28, wherein the candidate chemical agent is administered to an organism containing the cell.
30. The method of screening for a chemical agent of Claim 28, wherein Hairless activity is increased by the identified chemical agent.
31. The method of screening for a chemical agent of Claim 28, wherein Hairless activity is decreased by the identified chemical agent.
32. The method of screening for a chemical agent of Claim 28, wherein the identified chemical agent modulates Hairless gene activity.
33. The method of screening for a chemical agent of Claim 28, wherein the identified chemical agent modulates Hairless protein activity.